

5    **WHAT IS CLAIMED IS:**

1.     A digital radio receiver, the digital radio receiver comprising:  
a first receiver train, the first receiver train including:

an antenna:

a tuner coupled to the antenna for selecting a broadcast frequency;

an analog-to-digital converter coupled to the tuner;

a demodulator coupled to the analog-to-digital converter;

a storage unit;

a interface unit; and

a processor coupled to the demodulator, the processor separating two signal streams transmitted at the broadcast frequency, the first signal stream including program components, the second signal stream including indicia of the program components of the first signal stream.

2.     The digital radio receiver as recited in claim 1 wherein the processor uses the program indicia in the second signal stream to process the first signal stream.

3.     The digital radio receiver as recited in claim 1 wherein the tuner is a wideband tuner for receiving signals from all stations in the broadcast band.

4.     The digital radio receiver as recited in claim 3 wherein signal streams for multiple stations can be decoded to identify and process indicia related to program components or other information

5.     The digital radio receiver as recited in claim 1 wherein the program indicia identifies categories of program components in the first signal stream.

6.     The digital radio receiver as recited in claim 1 wherein the program indicia of the second signal stream identifies program components in the first signal stream.

7.     The digital radio receiver as recited in claim 1 wherein the program indicia of the second signal stream identifies a schedule for all program components in the receiver area

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8. The digital radio receiver as recited in claim 1 wherein the program indicia of the second signal stream identifies a schedule of program components in the first signal stream.

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9. The digital radio receiver as recited in claim 1 wherein the second signal stream includes information selected from the group consisting of time information, traffic information, promotional information, and information related to items for sale.

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10. The digital radio receiver as recited in claim 1 wherein the processor is programmable

11. The digital radio receiver as recited in claim 1 wherein the processor is hardwired.

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12. The digital radio receiver of claim 1 wherein the radio receiver includes a stand-by mode of operation, the standby mode operation storing and up-dating program indicia in the storage unit when program components are not being processed.

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13. The digital radio receiver as recited in claim 1, the radio receiver further comprising:

a second receiver train: the second receiver train including:

a scannable tuner coupled to the antenna for selecting a second broadcast frequency, the frequency of the scannable tuner determined by the processor;

a second analog-to-digital converter coupled to the tuner; and

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a second demodulator coupled to the second analog-to-digital converter, the output signal of the second demodulator being applied to the processor, the processor separating the second frequency signal into a new first signal stream and a new second signal stream, wherein the new first signal stream includes program components, the new second signal stream including indicia of the new first signal program components.

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14. The digital radio receiver as recited in claim 13 wherein the digital radio receiver includes a stand-by mode, wherein in the stand-by mode the first receiver train is

5     inactivated and the second receiver train continues to store and update information program  
indicia in the storage unit.

15     15.     The digital radio receiver as recited in claim 13 wherein the program indicia  
of the second signal stream identifies a schedule for all program components in the digital  
10     radio receiver area.

16.     The digital radio receiver as recited in claim 13 wherein the second signal  
stream includes information selected from the group consisting of time information, traffic  
information, promotional information, and information related to items for sale

15     17.     The digital radio receiver as recited in claim 13 wherein the processor is  
programmable.

20     18.     The digital radio receiver as recited in claim 13 wherein the processor is  
hardwired.

25     19.     The digital radio receiver as recited in claim 13 wherein the processor causes  
the second receiver to scan the broadcast frequencies available to the digital radio receiver,  
the processor using the new second signal stream to generate a schedule of program  
components of the available first signal streams.

30     20.     The digital radio receiver as recited in claim 13 wherein the processor uses  
the indicia of the second signal stream and the new signal stream to determine the next  
program component to be applied to the interface unit.

35     21.     The digital radio receiver as recited in claim 20 wherein the interface unit  
includes at least one of a speaker and a display unit.

22.     The digital radio receiver as recited in claim 13 wherein the second receiver is  
tuned to a selected station, the second station transmitting a signal stream providing a  
schedule for program components for a plurality of stations.

5           23.     The digital radio receiver of claim 13 wherein the radio receiver includes a stand-by mode of operation, the second receiver train in the standby mode operation storing and up-dating program indicia in the storage unit when program components are not being processed by the first receiver train.

10           24.     A method for providing programming information to a user of digital radio receiver; wherein the radio receiver unit includes a receiver train, a user interface, a processor, an input device, and a storage unit: the method comprising:

            in the receiver train, demodulating a signal from a transmitter, the signal having two signal streams; and

15           in the processor, separating the first signal stream from the second signal stream, wherein the first signal stream includes program components, the second signal stream having indicia related to the program components of the first signal stream.

20           25.     The method as recited in claim 24 wherein, when the indicia of the second signal stream meet preselected criteria, applying the first signal stream to the user interface.

26.     The method as recited in claim 24 wherein the indicia of the second signal stream identify the program components of the first signal stream.

25           27.     The method as recited in claim 24 wherein the indicia of the second signal stream identify characteristics of the program components of the first signal stream.

28.     The method as recited in claim 24 wherein the second signal stream includes information related to at least one of time, traffic conditions, promotional information, and  
30 information related to items for sale.

29.     The method as recited in claim 24 wherein, in a stand-by mode of operation, storing and up-dating the second signal stream indicia in a storage unit when the first signal stream is not being processed.

35           30.     The method as recited in claim 24 wherein the digital radio receiver further includes a second receiver train, the second receiver train having a scannable tuner operating

5 under control of the processor, and a demodulator, the demodulator applying second transmitter signals to the processor, the method further comprising:

in the processor, separating the signals from the second transmitter into a new first signal stream and a new second signal.

10 31. The method as recited in claim 30 further comprising using the indicia of the new second signal stream to determine the signal stream to determine the signal stream applied to the interface unit.

15 32. The method as recited in claim 30 further comprising;  
scanning the broadcast spectrum with the second receiver train;  
generating a program schedule; and  
storing the schedule in the storage unit.

20 33. The method as recited in claim 32 wherein the program schedule has program components with predetermined criteria.

25 34. The method as recited in claim 30 further comprising;  
scanning the broadcast spectrum with the second receiver train; and  
when the indicia in the new second signal steam meet preselected criteria, applying  
the new first signal stream to the interface unit.

30 35. The method as recited in claim 30 wherein, in a stand-by mode of operation, storing and up-dating program indicia processed by the second receiver unit in the memory unit when the are program components are not being processed.

36. A broadcast system comprising:  
at least one transmitter unit, the transmitter unit broadcasting two signal streams in over a given frequency band:

35 a receiver unit, the receiver unit including:  
an antenna;  
a receiver train coupled to the antenna, the receiver train being tuned to the given frequency band, the receiver unit demodulating the two signal streams;

5 a storage unit; and  
a processor, the processor separating the two signal streams into a program  
signal stream and an information signal stream, the information stream including information  
concerning the program signal stream.

10 37. The broadcast system as recited in claim 36 wherein the information signal  
stream includes a schedule for the program signal stream, the receiver unit further including a  
storage unit, the schedule of the program signal stream being stored in the storage unit.

15 38. The broadcast system as recited in claim 36 wherein the processor controls  
the frequency band to which the receiver train is tuned, the processor changing the frequency  
band to which the receiver train is tuned when the processor does not identify preselected  
indicia in the information signal stream.

20 39. The broadcast system as recited in claim 38 wherein the preselected indicia  
identify program components in the program signal stream.

40. The broadcast system as recited in claim 39 wherein the preselected indicia  
identify a class of program components.

25 41. The broadcast system as recited in claim 36 wherein the receiver unit has a  
stand-by mode, portions of the second signal stream being stored and up-dated in the storage  
unit when the program components are not being presented to the user.

30 42. The broadcast system as recited in claim 36 wherein the receiver unit  
includes:

a second receiver train, the second receiver train including a scannable tuner, the  
scannable tuner controlled by the processor; wherein the processor identifies indicia in the  
second frequency band.

35 43. The broadcast system as recited in claim 42 wherein the indicia in the second  
frequency band form a portion of a schedule of program components for the second  
frequency band.

44. The broadcast system as recited in claim 43 wherein the indicia in the second frequency band cause the tuner in the receiver train to be tuned to the second frequency band.

45. The broadcast system as recited in claim 43 wherein the receiver unit has a stand-by mode, indicia from the second receiver unit being stored and up-dated in the storage unit in the stand-by mode when program components are not being presented to the user.

46. In a digital radio receiver, a user interface, the user interface comprising a output device for displaying information, the information including at least one display selected from a group consisting of a list of broadcast stations matching predetermined user preferences, promotional advertising, scrolling text information, a scrolling program guide, a video display, and internet access.

47. The user interface as recited in claim 46 wherein the radio receiver receives signals from a broadcast transmitter; the radio receiver further including apparatus permitting a return path to the broadcast transmitter; the return path permitting a user of the digital receiver to respond to the information displayed on the user interface; the apparatus implementing the return path selected from the group consisting of a cellular phone, a Bluetooth to cellular link, a satellite link, and a microwave link: the return path permitting the user to engage in an activity selected from the group consisting of accessing the internet and the purchase of products.

48. The user interface as recited in claim 46 further comprising an input device, the input device selected from the group consisting of touch screen, manually-activated knobs, voice response system, and a keyboard.

49. The user interface as recited in claim 46 wherein the digital radio receiver has a processor coupled to the interface unit and a storage unit, the user interface permitting the user to apply a first signal stream to the output device, the user interface permitting the user to apply a second signal stream to the storage unit.

5           50.     A digital radio system including at least one transmitter and at least one  
receiver, the transmitter broadcasting signals comprising at least one format selected from the  
group of formats consisting of; a program component signal stream and a program guide  
signal stream, a program guide signal stream and at least one business signal stream, and at  
least one program content signal stream, a program guide signal stream and at least one  
10   business signal stream.

          51.     The digital radio system as recited in claim 50 wherein a business signal  
stream can include promotional material or items offered for sale.

15           52.     The digital radio system as recited in claim 50 wherein the signal streams are  
formed by time division multiplexing the broadcast signal stream.

          53.     The digital radio system as recited in 50 wherein the signal streams are  
implemented by a frequency division multiplexing the broadcast signal stream.